

REMARKS

Claims 1-6, 10 and 11 are pending in the present application.

Claim Rejections - 35 U.S.C. §§ 102 and 103

Claims 1, 2 and 4 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over **Wolski** (U.S. Patent 5,834,140); claims 1, 2 and 4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Wolski** in view of **Fatcheric** (U.S. Patent 5,679,230); and claims 3, 5, 6, 10 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over **Wolski** in view of **Fatcheric**.

Favorable reconsideration is requested.

A. Rejection based on Wolski

Applicant respectfully submits that Wolski does not disclose an electrodeposited copper foil comprising a matte side surface, “said matte side surface having a surface shape that is smooth with intermittently spaced knob-like projections” as recited in claim 1.

Applicant previously pointed out that Wolski does not disclose a smooth matte side surface with intermittently spaced knob-like projections. (Amendment, February 8, 2007.) Specifically, Applicant pointed out that Wolski discloses an untreated copper foil having “flatter surfaces” and “less unevenness,” and that an object of Wolski is to provide a copper foil having a high etching factor without lowering peeling resistance and accomplishing fine patterning without remaining copper particles. Applicant also pointed out that the deposited copper nodules disclosed in Wolski do not correspond with “knob-like” projections because the deposited copper nodules are not part of the surface shape as required by the claims. Thus, to one of ordinary

skill in the art, Wolski does not disclose knob-like projections formed intermittently on the surface.

In response, the Office Action takes the position that even though the surface in Wolski may be “flatter,” it will still have projections at the microscopic level, and that since Wolski discloses the same surface roughness, one of ordinary skill in the art would recognize that Wolski inherently has the same intermittently spaced knob-like projections. (Office Action, pages 4 and 7-8.)

However, the treated copper foil in Wolski, having a similar surface roughness as the untreated copper foil recited in the claims, does not inherently have knob-like projections. The Office Action incorrectly assumes that the copper foil in Wolski necessarily has knob-like projections because Wolski discloses a similar surface roughness. A copper foil having a similar surface roughness does not necessarily have knob-like projections.

Furthermore, the copper foil cited by the Office Action as corresponding to claim 1 is the copper foil of comparative example 1 in Wolski. (Office Action, page 3.) Wolski provides no details about the surface shape of the copper foil of comparative example 1. Thus, one of ordinary skill in the art would understand that the copper foil of comparative example 1 corresponds with a general copper foil, and not to a copper foil having a smooth surface with intermittently spaced knob-like projections.

The Office Action also takes the position that the deposited copper nodules become part of the copper foil in Wolski, and thus, the copper nodules become part of the surface shape of the copper foil. (Office Action, page 8.)

However, even though the copper nodules become attached to the surface of the copper foil, the copper foil and the copper nodules are distinct structural elements. The present claims recite that the surface shape of the copper foil is smooth with intermittently spaced knob-like projections. Thus, the Examiner incorrectly cites the copper nodules of Wolski as corresponding to the surface shape of the copper foil. The technique of depositing copper particles on a copper foil surface as a “roughening treatment” step is generally known. However, in the present invention as recited in the claims, the original foil itself has knob-like projections intermittently spaced on the smooth surface.

Applicant also previously pointed out that Wolski does not disclose the recited surface roughness for an untreated copper foil. Specifically, Applicant pointed out that the copper foil in Wolski has inferior physical properties because the untreated copper foil in Wolski does not meet the requirements as recited in claim 1, and thus, the present invention is structurally distinguishable from Wolski. Applicant specifically cited comparative example D in the specification as demonstrating the inferior properties of Wolski.

In response, the Office Action states that Applicant’s arguments are merely arguments of counsel which cannot take the place of evidence in the record. (Office Action, page 8.)

However, Applicant’s previous response cited comparative example D in the present specification for pointing out that the copper foil in Wolski has inferior properties. Comparative Example D has a surface roughness, before and after treatment, which corresponds with Wolski. (Specification, page 16, Table 7.) Comparative Example D has an untreated copper foil roughness of 0.8 μm . (Specification, page 16, Table 7.) After treatment at 400 A · min/m and

200 A · min/m, the peel strength is 0.6 and 0.59 kN/m respectively. (Specification, page 17, Table 8.) However, under the same treatment conditions, a copper foil of the present invention as recited in claim 1 has a peel strength of 1.22 and 1.21. (Specification, page 17, Table 8.)

The limitation “untreated copper foil” recited in claim 1 produces a copper foil having different and superior physical properties compared to Wolski, and thus provides a structural difference over Wolski.

Wolski does not disclose the elements as recited in claim 1 and the present invention is patentably distinguishable over Wolski.

B. Rejection based on Wolski in view of Fatcheric

The Office Action acknowledges that Wolski does not explicitly teach intermittently spaced projections. (Office Action, page 5.) The Office Action cites Fatcheric for disclosing a surface shape that is smooth with intermittently spaced knob-like projections. (Office Action, page 5 citing Fatcheric, Abstract.) Specifically, the Office Action cites the fine nodular metal deposit of Fatcheric for disclosing the intermittently spaced knob-like projections.

As stated above, even though the copper nodules become attached to the surface of the copper foil, the copper foil and the copper nodules are distinct structural elements. The present claims recite that the surface shape of the copper foil is smooth with intermittently spaced knob-like projections. Thus, the Office Action incorrectly cites the nodular metal deposit of Fatcheric as corresponding to the surface shape of the copper foil.

Furthermore, Fatcheric does not disclose a matte side surface having a surface shape that is smooth with intermittently spaced knob-like projections. Fatcheric discloses that “the matte

side should be relatively smooth in order to assure that the grain size and orientation are suitable for etching.” (Col. 2, lines 30-33.) Based on this statement in Fatcheric and Fig. 2 of Fatcheric, one of ordinary skill in the art would understand that Fatcheric does not disclose a matte side surface having a surface shape that is smooth with intermittently spaced knob-like projections.

If a foil has continuous projections, the etching process would proceed uniformly and the etching property would be achieved as in Fatcheric. Since the copper foil of Fatcheric is considered suitable for etching, one of ordinary skill in the art would conclude that the copper foil in Fatcheric has continuous projections and not intermittently spaced projections.

Fatcheric does not disclose a copper foil having a surface shape that is smooth with intermittently spaced knob-like projections. Thus, Wolski in view of Fatcheric does not disclose the elements as recited in claim 1.

Applicant notes that the present invention as recited in the claims provides an electrodeposited copper foil having a high peel strength and an excellent high frequency transmission property. None of the cited references disclose a copper foil having this feature.

For at least the foregoing reasons, claim 1 is patentable over Wolski and Wolski in view of Fatcheric, and claims 2-6, 10 and 11 are patentable by virtue of their dependence from claim 1. Accordingly, withdrawal of the rejection of claims 1-6, 10 and 11 is hereby solicited.

In view of the above remarks, Applicant submits that that the claims are in condition for allowance. Applicant requests such action at an early date.

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Response Under 37 C.F.R. § 1.116

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,
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